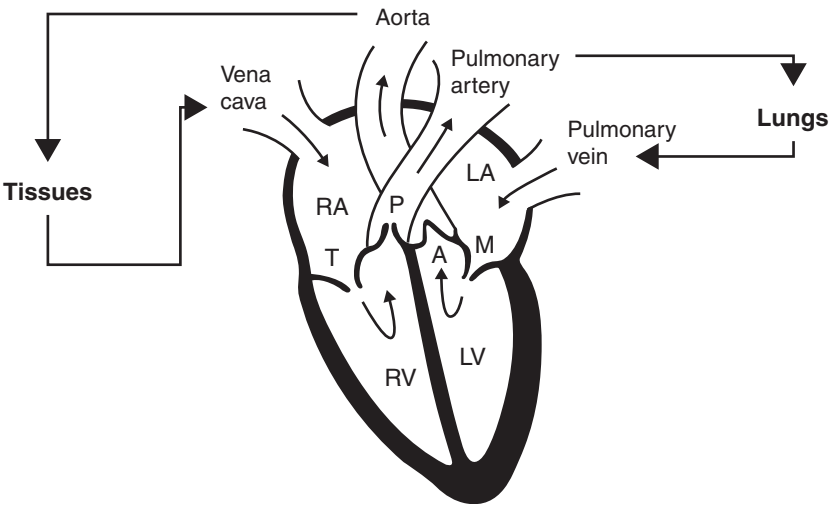

Figure 2.2. An example of a mechanism: the heart pumping blood. Labeled parts include RA: right atrium; LA: left atrium; RV: right ventricle; LV, left ventricle; T: tricuspid valve; M: mitral valve; P: pulmonary valve; A: aortic valve.

operations are separate from those operated on, in other cases the parts that perform operations may also be affected by the parts on which they operate (as I will discuss in Section 6, such feedback provides a prime way in which mechanisms can be self-regulating).

The component parts and operations of a mechanism do not present themselves to the scientist neatly distinguished and labeled as in a textbook. The investigations resulting in an understanding of the mechanism require *decomposing* it (taking it apart), conceptually if not physically. Corresponding to the division of parts and operations, there are two types of decomposition. What I refer to as *structural decomposition* decomposes a structure into component parts while *functional decomposition* decomposes the function into component operations. Though sometimes coordinated, it is not uncommon for these two types of decomposition to be pursued independently of each other, by scientists in different fields employing different tools. Often one decomposition proceeds more rapidly and successfully than the other, with considerable time elapsing before the slower inquiry catches up.

One example of structural decomposition is the discovery via anatomical dissection that (1) the body has a heart; and (2) the heart has four chambers (RA, LA, RV, and LV) and at least four valves (T, M, P, and A). Another example is the discovery via microscopy that (1) tissues are composed of cells; (2) cells contain a plasma membrane, nucleus, and cytoplasm; (3) cytoplasm